need to start antiretroviral therapy in the near future.

- **Minimally elevated ALT:** Approximately 40% of persons with chronic HCV infection have minimally elevated ALT levels (< 2 times upper limit of normal). Most of these persons probably have mild liver disease and are at low risk of rapid disease progression, but the histologic data evaluating this patient population are limited.

Inmates with minimally elevated ALT levels should have ALT levels remeasured over 3 to 6 months and should then be reassessed. The decision to obtain a liver biopsy in these inmates should be made on a case-by-case basis. Other factors to consider include the following:

- Inmates with HIV co-infection and a history of heavy alcohol consumption are at greater risk of developing cirrhosis;

- Inmates who acquired HCV infection at an older age are at greater risk of developing cirrhosis, particularly if HCV infection was acquired after the age of 40. Conversely, persons infected before the age of 20 are at much lower risk of developing cirrhosis.

- Inmates who are incarcerated for long periods of time may benefit from liver biopsy so that a long term treatment plan can be developed.

Inmates who are monitored without liver biopsy should have a targeted history and physical examination every 6 to 12 months along with platelet count, AST, ALT, alkaline phosphatase and prothrombin time measurements. A decreased platelet count, an increased AST/ALT (e.g., ratio > 1), a declining serum albumin, an increased alkaline phosphatase, or a prolonged prothrombin time may indicate underlying liver disease and warrants further evaluation.

- **ALT two times normal or greater:** Inmates with ALT levels two times the upper limit of normal or greater should have ALT measurements repeated at least twice over a 6 month period. Inmates with persistent elevations in ALT levels > twice normal should be referred directly for liver biopsy unless antiviral therapy is contraindicated.

- **Suspected compensated cirrhosis:** Inmates with suspected compensated cirrhosis based on clinical and laboratory parameters should be either referred directly for liver biopsy or treated empirically (without biopsy confirmation) in consultation with a specialist.

Confirmation of chronic HCV infection prior to liver biopsy: Inmate candidates for liver biopsy should have chronic HCV infection confirmed (if not done previously) through the detection of HCV RNA by a qualitative NAT with a lower limit of detection of 50 IU/mL or less. A single negative test should be repeated since HCV RNA levels may fluctuate.

Indications for antiviral therapy based on liver disease: Antiviral therapy is recommended for patients with chronic hepatitis C and a liver biopsy with portal or bridging fibrosis and at least moderate inflammation and necrosis. Persons with severe liver disease, including compensated cirrhosis, are at higher risk of developing liver complications and should therefore be priority candidates for treatment.

Inmates with normal liver histology or minimal fibrosis should be rebiopsied every one to five years. The timing of follow-up should be made on a case-by-case basis. Inmates with minimal fibrosis and marked hepatocellular necrosis and inflammation should be rebiopsied in one year or considered for treatment on a case by case basis, since these inmates are at greater risk of developing progressive fibrosis.

HCV genotype determination: The HCV genotype should be determined before prescribing antiviral therapy for chronic hepatitis C since the specific genotype affects the predicted response to treatment and helps determine the duration of therapy. Persons with genotypes 2 or 3 have a 76% to 82% response rate to pegylated interferon/ribavirin therapy compared to persons with genotype 1, who have a 40% to 45% response rate. All inmates should be considered potential candidates for treatment regardless of genotype. Once the HCV genotype has been determined in a specific patient, serial genotype testing is not indicated, unless reinfection is suspected, since HCV genotypes do not change during the course of an infection.

Measurement of baseline HCV RNA prior to treatment: All inmates should have a baseline NAT for HCV RNA prior to treating chronic hepatitis C. The recommended NAT depends on the HCV genotype.

- Inmates with genotype 2 or 3 should have a qualitative NAT with a threshold of detection of 50 IU/mL;

- Inmates with genotype 1 should have a quantitative NAT for HCV RNA (viral load).

Pretreatment studies and evaluations: Inmates should be evaluated by a physician and screened for co-morbid conditions that may complicate antiviral therapy.

- **Screening tests**: The following tests should be obtained (unless completed recently): Serum chemistries including liver enzymes, bilirubin, CBC with differential and platelet count, prothrombin time, TSH, renal function, anti-HIV, HBsAg, ferritin, ANA, fundoscopy for inmates with diabetes or hypertension, and other patient-specific diagnostic tests as medically indicated.

- **Pregnancy test for all female inmates: Ribavirin may cause fetal abnormalities. All female inmates of childbearing potential must have a pregnancy test prior to initiating therapy.**

- **Cardiac risk assessment**: Inmates should have a basic cardiac risk assessment from a clinician, since hemolysis from ribavirin may precipitate angina pectoris. Symptomatic inmates should be evaluated for cardiac disease prior to initiating treatment for chronic hepatitis C.

- **Mental health evaluation**: A mental health evaluation should be performed by a psychiatrist or a psychologist before prescribing interferon and ribavirin therapy to determine if mental health treatment is warranted prior to antiviral therapy or if ongoing mental health assessments are needed during treatment.

The evaluation should include an assessment of axis I and axis II diagnoses, including a comprehensive alcohol and substance abuse history, and a suicide risk assessment. Interferon therapy has been associated with changes in mood and affect in most individuals; in a small percentage, significant depression, suicide attempts and completed suicides have resulted. The absence of a history of depression or suicide attempts does not appear to lessen the risk of these side effects from interferon; however their presence should prompt heightened vigilance on the part of the treating providers.

Other mental illnesses or conditions, if not treated or not in remission, may adversely affect the inmate's ability to successfully complete a course of antiviral treatment, either due to issues of compliance or inability to tolerate even mild side effects.

- **Inmates with compensated cirrhosis**: Inmates with suspected or biopsy-confirmed compensated cirrhosis should have an upper endoscopy screening for esophageal varices, a liver ultrasound, and measurements of alpha-fetoprotein and ammonia prior to treatment initiation. If HCC or decompensated cirrhosis is diagnosed, antiviral therapy is contraindicated.

Treatment options for chronic hepatitis C: Pegylated interferon

(alfa 2a or alfa 2b) plus ribavirin is the preferred drug regimen for treating chronic hepatitis C in the absence of contraindications to either drug. Pegylated interferon is available in two formulations: PEG-Intron® and Pegasys®. Ribavirin is available in two formulations: Rebetol® and Copegus® that are considered bioequivalent by the Food and Drug Administration. Clinical studies have paired pegylated interferon alfa 2a with Copegus®; and pegylated interferon alfa 2b with Rebetol®.

A 24-week course of pegylated interferon and ribavirin is recommended for patients with genotypes 2 or 3; whereas a 48-week course of treatment is required for patients with genotype 1. Patients with genotype 1 require higher doses of ribavirin. The optimal duration of antiviral therapy is unknown for persons with genotypes 4, 5, 6, or nontypable HCV; therefore, these patients should be treated with the 48-week course of treatment recommended for genotype 1 patients. Inmates who have contraindications to ribavirin, regardless of genotype, should be treated with a 48-week course of pegylated interferon alone.

Detailed drug dosages, monitoring parameters, and potential side effects are outlined in **Appendix 11, Antiviral medications for Chronic Hepatitis C** and in **Appendix 12, Dosage Adjustments for Viral Hepatitis Medications.**

NOTE: Ribavirin should ordinarily be administered by directly observed therapy to ensure adherence.

NOTE: Ribavirin is completely ineffective as monotherapy and should never be prescribed without interferon.

NOTE: Patients with compensated cirrhosis have poorer SVR rates with interferon and ribavirin therapy compared to persons with less severe liver disease. Furthermore, once weekly pegylated interferon with ribavirin may not provide more benefit than three times a week interferon with ribavirin when treating these patients. Inmates with chronic hepatitis C and compensated cirrhosis should be treated in consultation with a physician specialist, since treatment recommendations for these patients are controversial and evolving.

Interferon/ribavirin side effects and adverse reactions: Inmates treated for chronic hepatitis C should be counseled by a clinician before and during treatment regarding both the anticipated and potential side effects/adverse reactions of interferon and ribavirin.

- **Interferon:** An influenza-like reaction often occurs within

6-8 hours of initial treatment with interferon. Fatigue, headache, fever, and myalgias occur commonly. This acute reaction may abate with subsequent treatments and can be partially aborted by premedication with antipyretics. Acetaminophen, can be given safely up to 2 gm/day in divided doses. Nonsteroidal anti-inflammatory agents (NSAIDS) should not be prescribed.

Chronic side effects of interferon can include severe fatigue, weight loss, reversible alopecia, irritability, rage, confusion, and neuropsychiatric disorders. Severe and incapacitating depression can occur, even in persons without previous histories of depression. Bone marrow suppression resulting in neutropenia and thrombocytopenia are potentially serious effects of interferon that should be anticipated and monitored closely particularly in patients with cirrhosis or HIV infection. Thyroid dysfunction occurs in approximately 4% of persons treated with interferon and may result in irreversible thyroid dysfunction, even with cessation of drug therapy.

Inmates with side effects to interferon should have their dosage reduced or therapy discontinued depending on the severity of the side effects. Serious sequelae may occur in less than 1% of persons receiving interferon treatment and can include: renal failure, pneumonitis, severe bone marrow suppression, visual and hearing loss, retinal hemorrhage, acute psychosis, and suicide.

NOTE: Pegylated interferons generally have similar side effect profiles compared to standard interferons, however, pegylated interferons do induce neutropenia to a greater degree.

- **Ribavirin:** Ribavirin causes a dose-related red cell hemolysis to variable degrees in nearly all persons who are treated. A decrease in the hemoglobin of 2 to 3 gm/dL and a decrease in hematocrit of 5% to 10% should be anticipated. Persons with a preexisting hemolysis or severe anemia (hemoglobin < 11 g or hematocrit < 33%) or underlying cardiovascular or cerebrovascular disease should not receive ribavirin. Persons with HIV infection or other co-morbid conditions should be monitored closely. Anemia ordinarily develops between 1 and 4 weeks of initiating therapy. New onset of episodic chest pain during therapy should be presumed to be angina pectoris until proven otherwise. Symptoms of sudden hemolysis such as dyspnea, fatigue, headache, and palpitations may develop. If anemia occurs ribavirin should be reduced in dosage or discontinued.

Ribavirin also causes histamine-like side effects such as nasal stuffiness and itching. More severe effects can include an asthma-like syndrome or bronchitis.

NOTE: Ribavirin may cause fetal abnormalities. All female inmates of childbearing potential must have a pregnancy test prior to initiating therapy. Both women AND men must be counseled to use adequate birth control during treatment and 6 months after treatment is completed. Counseling of both women AND men regarding the risk of birth defects is particularly important for inmates awaiting release and receiving ribavirin or who have recently completed treatment.

Treatment of chronic hepatitis C with co-morbid conditions:

- **Active substance abuse:** Inmates with histories of substance abuse and hepatitis C should be referred for drug education, nonresidential drug treatment, and residential drug treatment, as appropriate and in accordance with BOP policy as a component of their treatment plan. The timing of antiviral therapy and participation in drug treatment programs should be coordinated on a case-by-case basis. Inmates who are treated with antiviral therapy for chronic hepatitis C and then subsequently use illicit drugs or alcohol should be evaluated on a case by case basis to determine if treatment should be discontinued or maintained. The prescribing physician should consider multiple factors including: the effectiveness of antiviral therapy to date, the risk of illicit drugs to the inmate's health, and future adherence concerns to the prescribed antiviral regimen.

Inmates consuming alcohol should be specifically advised of the following:

- Alcohol use during antiviral treatment decreases the likelihood of a sustained response to treatment;

- The inability of an inmate with a history of alcoholism to abstain from even occasional alcohol ingestion during antiviral treatment is indicative of an unresolved substance abuse problem. Eradication of HCV infection without resolution of alcoholism is unlikely to prevent end-stage liver disease.

- **HBV and HCV co-infections:** Antiviral therapy for inmates with HBV and HCV co-infections should be initiated with great caution, and only in consultation with a specialist, due to the uncertainty of the risks and benefits of treatment and lack of a recommended treatment regimen.

- **HIV and HCV co-infection:** Effective antiretroviral therapy has markedly reduced the incidence of opportunistic infections and related mortality for persons with HIV infection. HCV-related liver disease has now emerged as a serious health concern for many persons with HIV infection. Antiviral therapy should be

considered for inmates with chronic hepatitis C and HIV co-infection, since HIV may accelerate the development of fibrosis and subsequent end-stage liver disease. Treatment strategies for persons with chronic hepatitis C and HIV infection are evolving, complicated by immune suppression, and affected by potential drug interactions and toxicities. Treatment decisions for these individuals should therefore be patient-specific, while considering the following:

- Treatment for HIV and HCV infections should not be initiated simultaneously;

- Inmates who have not been treated for either HIV infection or chronic hepatitis C should first be treated with antiretroviral therapy if the inmate is a candidate for treatment (AIDS or CD4+ T-cell count < 350 cells/mm^3); otherwise consider antiviral therapy for chronic hepatitis C in inmates with documented liver disease;

- Inmates on antiretroviral therapy for HIV infection should be considered for interferon and ribavirin therapy if they have documented liver disease; and if the HIV viral load is undetectable and the CD4+ T-cell count is > 350 cells/mm^3;

- Persons with HIV infection may be at greater risk of developing hepatotoxicity during interferon and ribavirin therapy. ALT levels should be monitored every 1 - 2 months while on therapy;

- Ribavirin and didanosine (ddI) should not be co-administered due to the increased risk of pancreatitis and lactic acidosis;

- Interferon and ribavirin side effects and drug toxicities may be more clinically significant in patients with HIV infection, (e.g., neuropsychiatric complications, neutropenia, and anemia), however treatment with interferon and ribavirin does not increase the risk of HIV-related opportunistic infections.

- **Latent TB and chronic HCV infection:** Inmates with latent TB infection and chronic HCV infection should be considered for isoniazid treatment and should be monitored for hepatotoxicity in accordance with the same guidelines established for patients without HCV infection. All inmates require frequent screening for symptoms of hepatitis while taking isoniazid. Inmates with baseline ALT elevations warrant periodic monitoring of ALT levels. Isoniazid should be discontinued in inmates with marked elevations in ALT levels or significant signs or symptoms of hepatitis.

Monitoring inmates during treatment for chronic hepatitis C:

- **Clinician evaluations:** Inmates receiving interferon and ribavirin should receive clinician evaluations weekly for one month, then monthly thereafter, to assess drug side effects and potential complications. Inmates with compensated cirrhosis, HIV infection, and other co-morbid conditions require more frequent monitoring, as do patients who develop significant side effects or complications while on therapy. Psychiatry and psychology consultations should be provided as clinically indicated while inmates are taking interferon.

- **Laboratory monitoring:** Inmates receiving interferon and ribavirin therapy should be monitored for drug toxicities in accordance with the following general guidance:

  - ALT at weeks 1,2, and 4, and at 8 - 12 week intervals thereafter (**NOTE:** An unusual but serious complication of interferon or interferon and ribavirin combination therapy is the paradoxical worsening of hepatitis. If ALT levels increase significantly, antiviral therapy should be discontinued, ALT levels should be monitored closely, and the inmate should be monitored for signs and symptoms of hepatitis);

  - Periodic bilirubin, prothrombin time, and serum chemistries, including creatinine/BUN; repeated with any new elevations in ALT or symptoms or signs of liver disease;

  - CBC with differential and platelet count at weeks 1, 2, and 4 and at 4 - 8 week intervals thereafter;

  - Thyroid function studies every 3 months during interferon therapy.

Assessing treatment response to antiviral therapy: The recommended duration of interferon and ribavirin combination therapy and the assessment of treatment response vary with HCV genotype.

- **Genotype 1 (1a or 1b):** Administer antiviral therapy for 12 weeks and check a quantitative NAT for HCV RNA to assess for early viral response (EVR) (**NOTE:** Use the same laboratory and same type of NAT when comparing pretreatment and post-treatment levels of HCV RNA). A minimum 2 log decrease in viral load after 12 weeks of treatment predicts a sustained viral response (SVR) and warrants continued treatment for another 36 weeks (total 48 weeks course of treatment). Antiviral therapy should be discontinued if HCV RNA levels do not adequately decline after 12

weeks of treatment.

- **Genotypes 2 and 3:** Administer antiviral therapy for 24 weeks in all patients unless complications develop. At the end of treatment, check a qualitative HCV RNA assay to determine treatment response.

- **Assessing SVR (all genotypes):** ALT levels should be obtained every 2 months for 6 months following the completion of antiviral therapy. A follow-up qualitative NAT for HCV RNA should be obtained 24 weeks after the completion of successful therapy in all patients to confirm the efficacy of treatment. Effective antiviral therapy results in a sustained viral response (SVR), defined as the absence of detectable HCV RNA in the serum measured by a qualitative NAT for HCV RNA with a lower limit of detection of 50 IU/ml or less at 24 weeks after the end of treatment.

Retreatment of chronic hepatitis C:

Patients who do not achieve a SVR following antiviral therapy can be categorized as nonresponders or relapsers.

- **Nonresponders:** These patients do not adequately respond to antiviral therapy by either(1) developing a SVR upon the completion of antiviral therapy or by (2) clearing viremia at a rate that predicts a SVR if treatment were continued.

- **Relapsers:** These patients have undetectable levels of HCV RNA at the end of treatment, but do not attain a SVR, i.e., HCV RNA is detectable by 24 weeks after completion of initially effective antiviral therapy.

Retreatment of relapsers and nonresponders may be considered on a case-by-case basis while considering the following:

- Relapsers should not be retreated with the same regimen;

- Long-term antiviral maintenance therapy is unproven and should not be prescribed.

- Retreatment should be considered for those inmates who are most likely to benefit from therapy and are at significant risk of disease progression by weighing the follow factors in combination:

  - The severity of underlying liver disease determined by liver biopsy;

- The viral genotype and other predictive factors that influence response rates;

- The previous regimen and the relative potency of the new regimen;

- The previous response to therapy.

Retreatment must be approved through Central Office for all cases using the current approval form found in the BOP National Formulary.

21. HEPATITIS C - INFECTION CONTROL

Patient education: All inmates should be counseled during orientation to the institution and when appropriate during clinical evaluations of the importance of preventing blood exposures to others during activities of daily living such as sharing toothbrushes and razors and through unsafe behaviors such as injection drug use, tattooing, and sexual contact with other inmates.

Reporting: Each institution should have a surveillance system for notifiable infectious diseases in accordance with BOP policy. Acute hepatitis C is a reportable condition in many States. Inmates with acute hepatitis C should be reported to local or State authorities where required and to the Central Office HSD. Inmates with chronic HCV infection should be reported to the local or State health authorities where required.

Containment: Inmates with acute hepatitis C and chronic HCV infection do not require isolation, but should be counseled on the specific measures necessary for preventing further transmission of HCV to others during incarceration and upon release and should be managed while incarcerated using standard infection control precautions. Non-disposable patient-care items must be appropriately cleaned, disinfected, or sterilized based on the use; and measures must taken to prevent cross contamination during patient care, e.g., dialysis, vascular access, cauterizing, dental procedures, etc., in accordance with CDC guidelines.

Hemodialysis:

- **Screening:** Inmates on hemodialysis without chronic HCV infection should have serum ALT levels measured monthly and anti-HCV measured by an immunoassay semi-annually to screen for newly acquired HCV infection. All inmates receiving hemodialysis with a positive anti-HCV screening immunoassay should have a

supplemental RIBA test performed. Inmates on hemodialysis with unexplained ALT elevations who are repeatedly anti-HCV-negative should be tested for HCV RNA by a NAT.

- **Infection control**: Infection control measures to reduce HCV transmission during hemodialysis should be implemented in accordance with CDC guidelines. Inmates with HCV infection receiving dialysis do not need to be isolated from other patients or dialyzed separately on dedicated machines. Dialyzers used for inmates with HCV infection can be reused.

Contact investigation: Contact investigations should be initiated for those inmates with acute hepatitis C who have been incarcerated during the 2 weeks-6 months prior to disease onset. A contact investigation tool is attached in **Appendix 13, Contact Investigation - Acute Hepatitis C**. In addition to documenting medical visits or procedures during which the inmate may have had blood exposure, inmates should be interviewed for information regarding recent drug injection, tattooing or body piercing and sexual contacts. Enhanced case-finding should be done, and counseling and testing for anti-HCV should be initiated for:

- sexual contacts;

- injection partners;

- others tattooed using same equipment.

Post-exposure Management:

- **Emergent care**: Wounds and skin sites that have been in contact with blood or bloody body fluids should be washed with soap and water. Exposed mucous membranes should be flushed with water. Squeezing the wound and treating with topical antiseptics are not recommended.

- **Counseling**: Inmates with percutaneous or mucosal exposures to blood should be assessed by a qualified health care provider and counseled regarding their risk of acquiring HCV infection, the natural history of HCV infection, and the recommendations for post-exposure management.

- **Post-exposure follow-up**: No vaccine or passive immunization is available to prevent acquisition of HCV infection following an exposure. The following guidelines should be used for managing inmate exposures to HCV:

- Whenever feasible, the source of the exposure should be tested for anti-HCV, unless the source's infection status is already

known;

- Exposed inmates should be referred for medical evaluation and follow-up;

- Anti-HCV by a screening immunoassay (confirmed by RIBA, if positive) and ALT levels should be measured at 0 and at 4-6 months following an exposure to screen for newly acquired HCV infection;

- HCV RNA may be detectable 1 to 3 months following an exposure to HCV-infected blood, however, since viremia may be transient, the absence of detectable HCV RNA does not preclude acute HCV infection;

- Inmates with evidence of newly acquired HCV infection should be appropriately counseled and referred for further medical evaluation including possible treatment of acute hepatitis C.

22. HEPATITIS D - TRANSMISSION OF HDV INFECTION

HDV is a defective RNA virus that requires HBsAg for structural integrity and replication. HDV is transmitted through percutaneous exposures to blood such as through injection drug usage. Sexual transmission occurs, but is much less efficient than for HBV. Perinatal transmission is rare. Inmates at highest risk for delta hepatitis have a history of injection drug use or have resided in areas of the world with a high prevalence of infection such as Turkey, Egypt, Southern Italy, Spain, Russia, Romania, and the Amazon River Basin.

23. HEPATITIS D - NATURAL HISTORY AND DIAGNOSIS

Natural history: Acute HBV-HDV coinfection (concurrent infections with HBV and HDV) results in a severe acute hepatitis more frequently than infection with HBV infection alone, but progression to chronic infection is uncommon. HBV-HDV superinfection (HDV infection acquired in a person with preexisting chronic HBV infection) results in chronic HDV infection in the large majority of persons who are at higher risk for cirrhosis and HCC compared to persons infected with HBV alone.

Diagnosis: Serologic detection of HDV infection varies depending on whether the virus is acquired through coinfection or superinfection.

Following HBV-HDV co-infection both IgM anti-HDV and IgG anti-HDV are detectable. IgM anti-HDV is more likely to be detectable

during the acute illness; whereas IgG anti-HDV is more like to be present during convalescence, but there is considerable overlap. Chronic infection is uncommon. IgG anti-HDV is usually undetectable with the disappearance of HBsAg and HDAg.

Following HBV-HDV superinfection, chronic HDV infection with detectable HDAg usually occurs. Both IgM anti-HDV and IgG anti-HDV remain detectable.

24. HEPATITIS D - TREATMENT

The treatment of acute delta hepatitis is supportive similar to the management of acute hepatitis B.

Periodic clinician evaluations should be conducted for inmates with chronic HDV infection in accordance with guidelines for monitoring chronic HBV infection. Inmates with chronic delta hepatitis should be considered candidates for antiviral therapy using the same criteria as inmates with chronic HBV infection.

NOTE: Antiviral therapy for delta hepatitis should be considered in consultation with a specialist. Treatment regimens may differ from those recommended for persons infected with HBV alone.

25. HEPATITIS D - INFECTION CONTROL

Patient education: All inmates should be counseled during orientation to the institution and when appropriate during clinical evaluations of the importance of preventing blood exposures to others during activities of daily living such as sharing toothbrushes and razors and through unsafe behaviors such as injection drug use, tattooing, and sexual contact with other inmates.

Reporting: Inmates with acute delta hepatitis should be reported to State and local health authorities as required. Acute delta hepatitis cases should also be reported to the Central Office HSD.

Containment: Inmates with acute delta hepatitis or chronic HDV infection do not require isolation, but should be counseled on the specific measures necessary for preventing further transmission of HDV to others during incarceration and upon release and should be managed while incarcerated using standard infection control precautions. Non-disposable patient-care items must be appropriately cleaned, disinfected, or sterilized based on the use; and measures must taken to prevent cross contamination during patient care, e.g., dialysis, vascular access, cauterizing, dental procedures, etc., in accordance with

CDC guidelines.

Hemodialysis: Routine testing for HDV infection for inmates receiving hemodialysis is not recommended. Inmates who are known to be infected with HDV should be isolated from all other dialysis patients, especially those who are HBsAg-positive.

Contact investigation: A contact investigation should be conducted for all inmates diagnosed with acute delta hepatitis using a similar approach as that recommended for acute hepatitis C cases (i.e., evaluating potential percutaneous exposures, such as injection drug use or tattooing). Suspected contacts should be tested for HBsAg in order to identify at-risk persons with chronic HBV infection (HBsAg-positive).

Post-exposure management: Wounds and skin sites that have been in contact with blood or body fluids should be washed with soap and water. Exposed mucous membranes should be flushed with water. Squeezing the wound or treating with antiseptics is not recommended. Prophylaxis for acute HBV infection should be provided to susceptible contacts. HDV can not infect an individual if infection with HBV is prevented with hepatitis B immunoglobulin/hepatitis B vaccine. Inmate contacts with chronic HBV infection should be counseled on the risk for HBV-HDV superinfection.

26. CIRRHOSIS

Morbidity assessment: The Model for Endstage Liver Disease (MELD) predicts liver disease severity and the risk of three month mortality based on serum creatinine, serum total bilirubin, and prothrombin time (INR). In a recent study of patients with end-stage liver disease awaiting liver transplantation, 3 month mortality varied with increasing MELD scores: MELD < 9, mortality was 1.9%; MELD of 20 - 29, mortality was 19.6%, MELD of 30 - 39, mortality was 52.6%; and MELD ≥ 40, mortality was 71.3%.

The value of MELD as a predictor of mortality is limited by its dependency on serum creatinine which can fluctuate with changes in fluid status. MELD is a better predictor of mortality for different populations than of death for any given individual. Nevertheless, MELD provides useful information for assessing the morbidity of inmates with end-stage liver disease.

All inmates with decompensated cirrhosis should have a MELD score determined to assess mortality risk. MELD scores should be recalculated over several weeks in inmates with shifting fluid status.

The MELD score can be automatically calculated at www.medcalc3000.com/UNOS.htm. The calculator can also be accessed stepwise through the United Network for Organ Sharing (UNOS) website, www.unos.org, by selecting resources, then meldpeldcalculator.

Inmates with MELD scores of 30 or greater should be considered for Medical Referral Center designation.

NOTE: The MELD score predicts mortality independent of clinical parameters such as hepatic encephalopathy, ascites, and variceal bleeding. These significant complications of cirrhosis, however, should also be considered in referring patients for Medical Referral Center designation.

Preventive measures: The following preventive measures should be considered for inmates with cirrhosis:

- Vaccination against influenza (annually), pneumococcal pneumonia, and hepatitis A and B (unless immune);

- Patient education on selecting a low-salt, low fat, "heart healthy" diet;

- Patient education regarding complete abstinence of alcohol during incarceration and after release, and the avoidance of iron supplements and potentially hepatotoxic medications, such as nonsteroidal inflammatory drugs (NSAIDS);

- Baseline endoscopy to screen for esophageal varices (Follow-up annual screening can be considered on a case-by-case basis, but the benefit of repeated screening is unclear. Once esophageal varices have been identified the risk of future variceal hemorrhage is 25% to 35%);

- Nonselective beta-blocker therapy, such as propranolol or nadolol, for inmates with large esophageal varices or red wale markings on endoscopy (The dose of beta-blocker should be titrated weekly to reduce the resting heart rate by 25%, but not less than 55 beats/minute or reducing the systolic blood pressure to lower than 90 mm Hg.) Long-acting nitrates can be added to nonselective beta-blockers in patients who do not respond to beta-blockers alone, but long-acting nitrates should not be used alone;

- Primary prophylaxis for spontaneous bacterial peritonitis (SBP) with an antibiotic, such as ciprofloxacin, should generally be limited to short treatment periods in high risk patients such as those with upper gastrointestinal hemorrhage;

- Periodic screening for HCC by ultrasonography (e.g., annually) and alpha-fetoprotein testing (e.g. semiannually), but note, the optimal screening strategy is uncertain.

ATTACHMENTS

Appendix 1:	**Contact Investigation - Acute Hepatitis A**
Appendix 2:	**Inmate Fact Sheet - Hepatitis B and C Viral Infections**
Appendix 3:	**Interpretation of Hepatitis B Virus Serologic Markers**
Appendix 4:	**Evaluation Strategy for the Treatment of Chronic Hepatitis B**
Appendix 5:	**Antiviral Medications for Chronic Hepatitis B**
Appendix 6:	**Viral Hepatitis Vaccine Doses and Schedules**
Appendix 7:	**Contact Investigation - Acute Hepatitis B**
Appendix 8:	**Management for HBV Exposures**
Appendix 9:	**Contraindications to Interferon or Ribavirin Therapy**
Appendix 10:	**Evaluation Strategy for the Treatment of Chronic Hepatitis C**
Appendix 11:	**Antiviral Medications for Chronic Hepatitis C**
Appendix 12:	**Dosage Adjustment for Viral Hepatitis Medications**
Appendix 13:	**Contact Investigation - Acute Hepatitis C**
Appendix 14:	**Resources (Viral Hepatitis)**
Appendix 15:	**Provider Self-Assessment (Viral Hepatitis)**

Appendix 1

Contact Investigation - Acute Hepatitis A

Inmate name/number: _____ **Date of report:**_____
Facility: _____ **Date/facility entry:** _____
Date/BOP entry:_____

Date of symptom onset: _____

Reported by (name and title): _____

Laboratory test	**Result**	**Date**
IgM anti-HAV		
IgM anti-HBc		
HBsAg		
anti-HCV	By ☐EIA ☐RNA ☐RIBA	
ALT/AST		

1. Reported to local health department?
☐Yes (date: _____) ☐No (reason: _____)

2. In the 2-6 weeks prior to illness onset, was patient in a BOP facility?
☐Yes (complete BOP investigation necessary) ☐No (local/state H.D. to do investigation, proceed to "**7. Contact notification**")

3. Risk factors (2-6 weeks prior to illness onset):
a) Did patient have close contact with a person with confirmed or suspected acute hepatitis A?
☐Yes ☐No
☐sexual
☐cell mate
☐dorm mate

b) Illicit drug use? ☐Yes ☐No
c) Sexual partners? ☐Yes (# _____) ☐No
d) Work assignments:

4. Detection and prevention of common source outbreaks:
a) Employed in food services? ☐Yes ☐No
(If Yes, enhance case finding among persons eating at location)
b) Part of a recognized common-source foodborne outbreak? ☐Yes ☐No

5. Vaccination history:
Vaccinated against hepatitis A? ☐No
☐Yes
When? Dose #1 date:_____ Dose #2 date:_____

6. Opportunities for prevention of this case:
Was patient a cell or dormitory mate of a person with acute hepatitis? ☐Yes ☐No

7. Contact evaluation for post-exposure prophylaxis: Susceptible inmate contacts should ordinarily receive immunoglobulin (IG) prophylaxis, 0.02 mL/kg IM in the deltoid or gluteal muscle to prevent acute HAV infection within 2 weeks of exposure. Consult with local or State health department prior to administration.

8. Susceptible contacts include: cellmates, close personal contacts, injection drug use contacts, and sexual contacts. (Establish line listing).

LINE LISTING - ACUTE HEPATITIS A

(Limited Official Use)

Cellmates, dorm mates, sexual contacts, persons sharing toilet facilities, etc.

☐	Contact Name	Reg. Number	Date IG given

Food Service (FS) workers screened (screen **foodhandlers*** in every case)

☐	Potential Source Name/FS Contact	Reg. Number	IgM anti-HAV†	Date IG given¶

† if symptomatic ¶ if the index case is a **foodhandler***

If **foodhandler*** has acute hepatitis A: identify housing units/dorm/etc. with inmates eating food from location where foodhandler worked while ill and consider IG prophylaxis for inmates from these housing units (consult first with health department)

☐	Housing unit/dorm/other identified area	Date IG given

* **Foodhandler** - food service workers who prepare or touch the food before it is eaten.

Appendix 2

INMATE FACT SHEET
(Hepatitis B and Hepatitis C Viral Infections)

Am I at risk of being infected with hepatitis B virus (HBV) or hepatitis C virus (HCV)?

- You may be at risk for HBV or HCV infection if you have ever injected drugs or had sex with an infected partner. HBV is more easily transmitted through sex and from a mother to her child compared to HCV. Persons receiving blood transfusions prior to 1992 may be at risk for HCV infection. Talk to a health care provider about the risks of infection that affect you personally.

How can I prevent getting HCV or HBV while I am in prison?

- Do not have sex with other inmates, shoot drugs, or get a tattoo or body piercing.
- Do not share toothbrushes, razors, nail clipping devices, or other personal items that might have blood on them with other inmates.

Are these infections dangerous to my health?

- Most persons infected with HBV or HCV do not develop serious health problems, however a small, but significant number of patients develop serious liver disease. Talk to a health care provider about your personal risks for developing liver disease.

Why should I be tested for HBV or HCV infection?

- You should be tested if you are at risk so doctors can monitor your infection and assess your need for treatment now or in the future. You should also be tested so that you can better prevent others from getting infected including your infant if you are pregnant.

How do I get tested for HBV or HCV?

- A simple blood test can determine if you are infected.

How can I prevent giving HBV or HCV to others if I am already infected?

- First, remember that you can spread these infections even if you feel fine.

- Do not shoot drugs or have sex with other inmates.

- Do not share personal items that might have your blood on them, such as toothbrushes, dental appliances, nail-clipping equipment or razors.

- Cover your cuts and skin sores to keep your blood from contacting other persons.

- If you are being released, talk to a health care provider about specific ways you can reduce the risk of spreading HBV or HCV to others.

Appendix 3

INTERPRETATION OF HEPATITIS B VIRUS SEROLOGIC MARKERS*

Serologic Markers				Interpretation
HBsAg	**Total anti-HBc**	**IgM anti-HBc**	**Anti-HBs**	
-	-	-	-	Susceptible, never infected
+	-	-	-	Acute infection, early incubation **
+	+	+	-	Acute infection§
-	+	+	-	Acute resolving infection§
-	+	-	+	Past infection, recovered and immune
+	+	-	-	Chronic infection
-	+	-	-	Multiple interpretations¶
-	-	-	+ ≥10 mIU/mL	Immune from vaccination

*Adapted from CDC guidelines, Recommendations for preventing transmission of bloodborne pathogen infections among chronic hemodialysis patients, *MMWR* 2001;50(RR-5):1-43.

** **NOTE:** Transient HBsAg positivity (lasting < 21 days) might be detected in some patients during vaccination

§ IgM usually wanes after 6 months post-infection, but may persist for up to 2 years.

¶ Remote infection (anti-HBs may be absent since it wanes with time and may disappear with remote history of infection), a false positive test (i.e., susceptible), resolving acute infection, or "low-level" chronic infection.

HBsAg is hepatitis B surface antigen.

Total anti-HBc is total antibody to hepatitis B core antigen.

IgM anti-HBc is the immunoglobulin M antibody to hepatitis B core antigen.

Anti-HBs is antibody to hepatitis B surface antigen.

Appendix 4

EVALUATION STRATEGY
TREATMENT OF CHRONIC HEPATITIS B

Diagnose chronic hepatitis B
HBsAg+ 6 - 12 months
↓
HBeAg+/HBV DNA+; OR
HBeAg-/HBV DNA+
↓

Baseline evaluation
Counseling/history and physical examination/assess alcohol use and substance abuse
Refer to drug education and treatment programs as appropriate
If decompensated cirrhosis is present → consider lamivudine
If decompensated cirrhosis is not present → monitor ALT
↓

ALT monitoring
If ALT is normal → monitor ALT every 3-6 months
If ALT is elevated above upper limit of normal → confirm ALT elevation over 3-6 months
IF ALT elevation is confirmed and HBV DNA is $> 10^5$ cps/mL refer for liver biopsy
↓

Liver biopsy
Normal biopsy/minimal inflammation → monitor HBe/HBsAg/repeat biopsy
Evidence of liver necroinflammation ≥4 → consider drug therapy
↓

Antiviral Drug therapy
Drug therapy should be patient-specific → Consider:
degree of liver disease/HBe status/co-morbid conditions/prior treatment history

NOTE: The long-term benefits of antiviral therapy for chronic hepatitis B are uncertain. The decision to recommend treatment for chronic hepatitis B should be based on the severity of liver disease, the likelihood of response, co-morbid conditions, and the potential for adverse reactions. The specific treatment regimen should be determined on a case-by-case basis (see text).

ANTIVIRAL MEDICATIONS FOR CHRONIC HEPATITIS B

Medication	Dosage	Baseline tests	Monitoring**	Toxicities	Comments
Interferon alfa (2a or 2b) (Roferon-A) (Intron-A)	5 million units SC daily; OR 10 million units SC 3x/week - for 16-24 weeks HBeAg-negative patients require longer duration, e.g. ≥ 12 months	anti-HIV, anti-HCV anti-HDV HBeAg, HBV DNA ALT/AST, liver function CBC (with diff and plts) chemistry panel creatinine/BUN thyroid function studies mental health assessment	clinician evaluations every week X 1 month then monthly CBC (with diff and plts) ALT/liver function creatinine/BUN, TSH psychology/psychiatry monitoring as necessary	fever fatigue myalgia psychiatric (rage, confusion, depression) bone marrow suppression thyroid dysfunction renal failure	contraindicated with decompensated cirrhosis drug interaction: concomitant use of interferon alfa-2b significantly increases theophylline levels
Lamivudine (Epivir-HBV®)	100 mg orally, daily for 1 year or more drug resistance may develop	same as above except thyroid studies and mental health assessment only necessary if clinically indicated	clinician evaluations every week X 1 month then monthly ALT/liver function creatinine/BUN	lactic acidosis hepatomegaly/steatosis pancreatitis	some improvement possible with decompensated cirrhosis higher dose as part of HAART* regimen in HIV-coinfected patients
Adefovir dipivoxil (Hepsera®)	10 mg orally, daily optimal duration is uncertain; tx for at least 48 weeks; hepatitis may worsen when drug tx is stopped	same as above except thyroid studies and mental health assessment only necessary if clinically indicated	clinician evaluations every week X 1 month, then monthly ALT/liver function creatinine/BUN	renal failure - seen with higher doses lactic acidosis hepatomegaly/steatosis HIV resistance	a HAART* regimen is recommended for persons with HBV/HIV co-infections treated with adefovir medication well tolerated and drug resistance does not develop

*HAART is highly active antiretroviral therapy.
**See monitoring parameters in Guidelines text.

Appendix 6

VIRAL HEPATITIS VACCINE DOSES AND SCHEDULES

Hepatitis A and B Vaccines for Adults

Virus/Vaccine Type	Dose (*mL*)	Volume Doses	No. of (months)	Schedule
Hepatitis A				
Havrix †	1,440 EL.U. * ^	1.0	2	0 and between 6 - 12
VAQTA $	50 U ^	1.0	2	0 and between 6 - 12
Hepatitis B				
Recombivax-HB $	10 *mcg* ^	1.0	3	0, 1, and 6
Engerix-B †	20 *mcg* ^	1.0	3	0, 1, and 6
Hepatitis A and B combination				
Twinrix †	20 *mcg* (B) ^ 720 EL.U. (A)	1.0	3	0, 1, and 6

Source: Adapted from CDC guidelines, *MMWR* 2003;52(No. RR-1)

Hepatitis B Vaccines for Hemodialysis-dependent Adults

Virus/Vaccine Type	Dose (*mL*)	Volume Doses	No. of (months)	Schedule
Hepatitis B				
Recombivax-HB $	40 *mcg* ^	1.0	3	0, 1, and 6
Engerix-B †	40 *mcg* ^	2.0 ¶	4	0, 1, 2, and 6

Source: Adapted from CDC guidelines, *MMWR* 2001;50(No. RR.- 5)

† Manufactured by GlaxoSmithKline Biologicals
$ Maufactured by Merck & Co., Inc.
* Enzyme linked immunosorbent assay (ELISA) units.
¶ Two 1.0 *mL* doses administered at one site in a 4-dose schedule at 0, 1, 2, and 6 months.
^ Recommended route/site for administration is the deltoid by intramuscular injection.

Appendix 7

CONTACT INVESTIGATION - ACUTE HEPATITIS B

Inmate name/number: _____ **Date of report:**_____
Facility: _____ **Date/facility entry:** _____
Date/BOP entry:_____

Date of symptom onset: _____

Reported by (name and title): _____

Laboratory test	**Result**	**Date**
IgM anti-HAV		
IgM anti-HBc		
HBsAg		
anti-HCV	By ☐EIA ☐RNA ☐RIBA	
ALT/AST		

1. Reported to local health department?
☐Yes (date: _____) ☐No (reason:_____)

2. In the 6 weeks-6 months prior to illness onset, was patient in a BOP facility?
☐Yes (complete BOP investigation necessary) ☐No (local/state H.D. to do investigation)

3. Risk factors (6 weeks - 6 months prior to illness onset):
a) Did patient have close contact with a person with confirmed or suspected HBV infection?
☐Yes ☐No
☐sexual
☐cell mate
☐dorm mate
☐other (specify: _____)
(If known contact, evaluate prior opportunities for immunoprophylaxis)
b) Injection drug use? ☐Yes ☐No
c) Sexual partners? ☐Yes (# _____) ☐No
d) Other reported contact with human blood? ☐No
☐Yes (when/what circumstances? _____)
e) On dialysis? ☐Yes ☐No

☐ Dialysis center notified
f) Recent hospitalization? ☐No
☐Yes (When? Where? _____)
g) Recent IV infusions or injections received in outpatient setting? ☐No
☐Yes (When? Where? _____)
h) Recent dental work ☐No
☐Yes (When? Where? _____)
i) Recent tattoo ☐Yes ☐No
j) Body piercing ☐Yes ☐No

4. Vaccination history:
Vaccinated against hepatitis B? ☐No
☐Yes
When? Dose #1 date:_____ Dose #2 date:_____ Dose #3 date____ ___

5. Review prior opportunities for prevention of this case:
a) Was patient a cell or dormitory mate of a person with acute hepatitis? ☐Yes ☐No

6. Contact evaluation: Consider total anti-HBc testing to determine contacts' susceptibility.

7. Contact management: Inmates in close contact with an inmate diagnosed with acute hepatitis B should be considered for post-exposure prophylaxis.

NOTE: For susceptible inmate contacts with identified or suspected per cutaneous or mucosa exposures, administer post-exposure prophylaxis by initiating the first dose of hepatitis B vaccine series IM in the deltoid muscle along with HBIG 0.06 ml/kg body weight IM at a separate site (Give HBIG only if within 7 days of exposure).

NOTE: For susceptible inmate contacts without identified or suspected per cutaneous or mucosa exposures, initiate the first dose of hepatitis B vaccine, but do not give HBIG.

NOTE: Contacts include: injection drug use contacts, sexual contacts, tattoo contacts, and close personal contacts (Establish line listing).

LINE LISTING - HEPATITIS B
(Limited Official Use)

Suspected per cutaneous or mucosa exposure:

☐	Contact Name	Reg. Number	Date BIG given	Date vaccinated

Close contacts (i.e., cellmates, sharing of personal items, etc.) without identified percutaneous/mucosal exposure (i.e., ring vaccination):

☐	Contact Name	Reg. Number	Date vaccine series initiated

Management of Hepatitis B Virus Exposures*

Vaccination Status/Antibody Status	Treatment Based on Source's HBsAg Status		
	HBsAg positive	HBsAg negative	Unknown Status
Unvaccinated	HBIG** X 1; Initiate HB vaccine series	Initiate HB vaccine series	Initiate HB vaccine series
Vaccinated - known responder Adequate anti-HBs is ≥10 mIU/ml	No treatment	No treatment	No treatment
Vaccinated - known nonresponder	HBIG X 1 and revaccination series, OR HBIG X 2 ***	No treatment	Treat as if source were HBsAg-positive
Vaccinated - unknown response status	Test exposed person for anti-HBs: If adequate - no tx If inadequate - HBIG X 1 PLUS vaccine booster	No treatment	Test exposed person for anti-HBs: If adequate - no tx If inadequate - give vaccine booster/recheck titer in 1 - 2 months

* Exposure is percutaneous (laceration, needlestick, bite) or permucosal (ocular or mucous-membrane) contact with blood.
** HBIG dose is 0.06 mL/kg administered IM at different site than vaccine, preferably < 24 hours after exposure, but no greater than 7 days post- exposure.
*** Give 1 dose of HBIG and reinitiate vaccine series for nonresponders who have not completed second 3-dose vaccine series; Give HBIG X 2 for nonresponders who have failed second vaccine series

Adapted from CDC guidelines, Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for post-exposure prophylaxis. *MMWR* 2001;50(RR-11):1-52.

Appendix 9

CONTRAINDICATIONS FOR INTERFERON/ RIBAVIRIN THERAPY*

INTERFERON
(standard and pegylated)

Absolute Contraindications:

Decompensated cirrhosis
Hypersensitivity to interferon
Solid organ transplantation
Active suicidal ideation or other neuropsychiatric condition that is poorly controlled
Ongoing alcohol or illicit drug usage - refer for evaluation

Relative Contraindications:

Age > 60 years
Bone marrow dysfunction - neutropenia/thrombocytopenia
Hepatitis B co-infection
HIV infection with acquired immunodeficiency syndrome (AIDS)
Diabetes that is poorly controlled
Renal insufficiency; creatinine clearance < 50 ml/min
History of recent alcohol abuse or illicit drug usage - refer for evaluation

RIBAVIRIN

Absolute Contraindications

Pregnancy - due to risk of fetal malformations and fetal death; pregnancy test required
NOTE: women of childbearing potential AND men must use two forms of effective contraception during treatment and during the six-months post-treatment
Hemoglobinopathies, hemolytic anemias or other severe anemias
Ischemic cardiovascular disease or cerebrovascular disease
Renal insufficiency - creatinine clearance < 50 ml/min

***Refer to drug manufacturers' warnings in addition to highlighted contraindications**

Appendix 10

EVALUATION STRATEGY FOR TREATMENT OF CHRONIC HEPATITIS C

Screen for HCV infection

EIA+ or CIA+ for high risk inmates
EIA+ or CIA+ supplemented by RIBA+ for low risk inmates
OR
EIA+ or CIA+ with high signal-to-cutoff ratio - no RIBA required
EIA+ or CIA+ with low signal-to-cutoff ratio - confirm with supplemental RIBA+

↓

Conduct baseline evaluation

Medical history/assess alcohol use/substance abuse/counseling on risk reduction
Refer to drug education/drug treatment programs as appropriate
Physical examination/basic lab studies including liver enzymes/function studies
Evaluate other potential causes of liver disease as appropriate
Evidence of decompensated cirrhosis - manage without antiviral therapy

↓

Review contraindications to antiviral treatment

Assess contraindications to interferon and ribavirin prior to liver biopsy
Mental health assessment

↓

Assess ALT measurements

If ALT is two times normal or greater - confirm elevation and refer for liver biopsy
If ALT is persistently normal or < 2 times normal - biopsy selectively - (see text)
If evidence of compensated cirrhosis - consider liver biopsy or treat empirically

↓

Confirm chronic HCV infection prior to liver biopsy

Detect HCV RNA by qualitative NAT assay with threshold of < 50 IU/mL

↓

Stage liver disease and assess indications for treatment

Liver biopsy to assess degree of fibrosis and inflammation (see text)
If liver biopsy is normal or shows minimal fibrosis - monitor/rebiopsy in 1-5 years
If liver biopsy shows portal or bridging fibrosis and moderate inflammation and necrosis - consider antiviral therapy

↓

Determine HCV genotype and test for HCV RNA prior to treatment

Determine HCV genotype
If genotype 1 - obtain quantitative HCV RNA assay
If genotype 2 or 3 - obtain qualitative HCV RNA assay

↓

Review and complete relevant studies and evaluations prior to treatment

Physician evaluation and review of liver enzymes, bilirubin, albumin, prothrombin time
Serum chemistries/CBC/platelet count/thyroid function studies
Ferritin/ANA/other liver diagnostic studies as appropriate
Pregnancy test for all females
Cardiac risk assessment
Mental health assessment

↓

Initiate antiviral drug therapy

(HCV Genotype 2 or 3)
Treat with pegylated interferon/ribavirin combination therapy for 24 weeks and;
check qualitative HCV RNA at completion of treatment.

(HCV Genotype 1)
Treat with pegylated interferon/ribavirin therapy and;
check HCV RNA quantitative assay after 12 weeks.
If viral levels have not decreased by 2 logs (10^2) at 12 weeks - discontinue therapy;
otherwise continue therapy for 48 weeks.
Check HCV RNA assay at completion of treatment

(All Genotypes - if ribavirin contraindicated)
Treat with pegylated interferon for 48 weeks
Monitor like genotype 1 patients on combination therapy

↓

Monitor post-treatment

Repeat ALT every 2 months for 6 months after completion of effective therapy
Measure HCV RNA 6 months after completion of effective therapy
Referral to drug education/tx program if appropriate and not previously completed

Antiviral Medications for Chronic Hepatitis C - Interferon Preparations

Medication	Dosage	Baseline tests	Monitoring	Toxicities	Comments
Interferon alfa (2a or 2b) (Roferon-A®) (Intron-A®)	3 million units SC 3x/week	history and physical ALT, AST, bilirubin, albumin, alkaline phosphatase PT/INR CBC (with diff and plts) chemistry panel creatinine/BUN thyroid function studies ferritin/ANA anti-HIV HBsAg liver biopsy HCV genotype HCV RNA NAT psychologic/psychiatric evaluation	clinician evaluations (every week X 1 month, then monthly) ALT at weeks 1, 2, 4, and 8-12 weeks thereafter CBC (with diff and plts), at weeks 1, 2, 4, and 4-8 weeks thereafter TSH every 3 months renal and liver function studies periodically; and whenever clinically warranted screen for depression psych/psych evaluations as clinically needed	fever fatigue myalgia neuropsychiatric (rage, confusion, depression, suicide) bone marrow suppression thyroid dysfunction renal failure	pegylated interferon in combination with ribavirin is the recommended treatment regimen for chronic hepatitis C for most patients peginterferon alfa-2b (PEG-Intron®) is available only via the PEG-Intron Access Assurance Program Patients with compensated cirrhosis and HIV co-infection may have more severe adverse effects: monitor hematologic parameters closely
Pegylated Interferon alfa-2b (PEG-Intron®)	1.5 mcg/kg SC q week with ribavirin 1.0 mcg/kg SC q week when used as monotherapy				
Pegylated Interferon alfa-2a (PEGASYS®)	180 mcg SC q week				

Antiviral Medications for Chronic Hepatitis C - Ribavirin Preparations

Medication	Dosage	Baseline Tests	Monitoring	Toxicities	Comments
Ribavirin with interferon 200mg caps (REBETOL®)	≤ 75 kg: 400 mg PO q AM 600 mg PO q PM >75 kg: 600mg PO BID	CBC with diff and platelets; see baseline tests for interferon since ribavirin always given in combination with interferon preparation **pregnancy test for all female inmates**	ongoing monitoring of hemoglobin and hematocrit for evidence of hemolytic anemia, which often occurs between 1 and 4 weeks after initiating therapy. **NOTE: women of childbearing potential AND men must use two forms of birth control during treatment AND during the 6 months after antiviral therapy is completed.** consider monthly pregnancy tests for female inmates at risk of pregnancy, e.g., community access	hemolysis - expect 5% - 10% decrease in hematocrit NOTE: patients with cirrhosis may have more severe anemia NOTE: anemia may precipitate angina, dyspnea, fatigue **teratogenic** - counsel women AND men regarding the risk of birth defects and the necessity of birth control before, during, and after treatment is completed. counseling is particularly important for inmates awaiting release.	ribavirin capsules should to be taken with food **ribavirin should be administered on pill line to ensure compliance and increase efficacy** the optimal dose of ribavirin depends on HCV genotype, i.e., higher doses are required for genotype 1 ribavirin should not be used in patients with a creatinine clearance of <50 ml/min
Ribavirin[1,2] (/pegylated interferon)	<u>REBETOL®</u> genotype 2 or 3: 400 mg PO BID genotype 1: same dosages as used when combined with nonpegylated IFN <u>COPEGUS®</u> genotype 1 or 4: <75 kg = 400 mg PO qAM 600 mg PO qPM >75kg = 600 mg PO BID genotype 2 or 3: 400 mg PO BID				

[1]COPEGUS® and REBETOL®, are formulated as tablets and capsules respectively; and are considered to be bioequivalent by the FDA.
[2]In clinical studies pegylated interferon alfa-2a was administered with COPEGUS ® and pegylated interferon alfa-2b was administered with REBETOL®.

Appendix 12

DOSAGE ADJUSTMENTS FOR VIRAL HEPATITIS MEDICATIONS

Medication	Parameter	Adjustment
Lamivudine	creatinine clearance (mL/min) ≥ 50	100 mg/day
	30-49	100 mg first dose, then 50 mg/day
	15-29	100 mg first dose, then 25 mg/day
	5-14	35 mg first dose, then 15 mg/day
	<5	35 mg first dose, then 10 mg/day
Interferons	WBC < 1500 neutrophil ct < 750 platelet ct < 80,000	reduce dose by 50%
Ribavirin	hemoglobin < 10g/dl	reduce dose to 200 mg AM, 400 mg q HS
Ribavirin and Interferons	hemoglobin < 8.5 g/dL WBC < 1000 neutrophil ct < 500 platelet ct < 50,000	discontinue
Special patients: For inmates with history of cardiac disease (CHF, previous history of MI, angina, or known coronary artery disease by angiography)		
Ribavirin	2 g/dL drop in hemoglobin during any four week period of treatment.	reduce dose to 200 mg AM, 400 mg q HS
Interferon		reduce dose by 50%
Ribavirin and Interferons	hemoglobin < 12 g/dL after 4 weeks at reduced dose above	discontinue

Appendix 13

Contact Investigation - Acute Hepatitis C

Inmate name/number: _____ **Date of report:**_____
Facility: _____ **Date/facility entry:** _____
Date/BOP entry:_____

Date of symptom onset: _____

Reported by (name and title): _____

Laboratory test	**Result**	**Date**
IgM anti-HAV		
IgM anti-HBc		
HBsAg		
anti-HCV	By ☐EIA ☐RNA ☐RIBA	
HCV RNA (qual. or quant.)		
ALT/AST		

1. Reported to local health department?
☐Yes (date: _____) ☐No (reason: _____)

2. In the 2 weeks-6 months prior to illness onset, was patient in a BOP facility?
☐Yes (complete BOP investigation necessary) ☐No (local/state H.D. to do investigation)

3. Risk factors (2 weeks - 6 months prior to illness onset):
a) Did patient have close contact with a person with confirmed or suspected HCV infection?
☐Yes ☐No
☐sexual
☐cell mate
☐dorm mate
☐other (specify: _____)
(If known contact, evaluate prior opportunities for immunoprophylaxis)

b) Injection drug use? ☐Yes ☐No

c) Sexual partners? ☐Yes (# _____) ☐No

d) Other reported contact with human blood? ☐No
☐Yes (when/what circumstances? _____)

e) On dialysis? ☐Yes ☐No
☐ Dialysis center notified

f) Recent hospitalization? ☐No
☐Yes (When? Where? _____)

g) Recent IV infusions or injections received in outpatient setting? ☐No
☐Yes (When? Where? _____)

h) Recent dental work ☐No
☐Yes (When? Where? _____)

i) Recent tattoo ☐Yes ☐No

j) Body piercing ☐Yes ☐No

4. Prior opportunities for prevention of this case:
Was patient a cell or dormitory mate of a person with acute hepatitis? ☐Yes ☐No

5. Contact notification (HCV counseling and testing should be offered and line listing established):

LINE LISTING - ACUTE HEPATIS C
(Limited Official Use)

☐	Contact Name	Anti-HCV status (+ or -)	Reg. Number	Date of counseling/testing

Appendix 14

RESOURCES
(Prevention and Treatment of Viral Hepatitis)

National Institutes of Health
National Digestive Diseases Information Clearinghouse
http://www.niddk.nih.gov
1-301-654-3810

Centers for Disease Control and Prevention
1-888-443-7232
(4HEPCDC)
http://www.cdc.gov/ncid

National Clinicians' Post-Exposure Prophylaxis Hotline
1-888-448-4911

PROVIDER SELF-ASSESSMENT
(Prevention and Treatment of Viral Hepatitis)

Question #1
Which of the following statements is FALSE regarding the transmission of viruses that cause hepatitis?

A. HAV is spread by fecal-oral contact.
B. HBV, HCV, and HIV are all transmitted by percutaneous exposures.
C. HCV was not readily transmitted by blood transfusions after 1992.
D. HDV can not cause chronic infection and hepatitis without the presence of HBV.
E. HBV infection is not a sexually transmitted disease.

Question #2
Which of the following is FALSE regarding HBV infection?

A. Persons with chronic HBV infection (HBsAg-positive) are potentially contagious.
B. Most persons acutely infected with HBV will develop chronic hepatitis.
C. Persons with chronic HBV infection sometimes clear HBV infection without treatment.
D. Anti-HBs protects a person from new HBV infections.

Question #3
An inmate who is HBsAg-positive shares his tattoo needle with 4 other inmates who have never been vaccinated for hepatitis B and all have unknown immunity to HBV infection. Which of the following statements is false regarding the management of the exposed inmates in this setting?

A. Immediate treatment with hepatitis B immunoglobulin (HBIG) is warranted.
B. The hepatitis B vaccine series should be initiated concurrently with HBIG.
C. If the exposures occurred 3 months ago HBIG will still be effective.
D. Both HBIG and hepatitis B vaccine are indicated for exposed HIV seropositive inmates.

Question #4
Which of the following is FALSE regarding HCV infection?

A. RIBA testing is usually necessary for screening inmates with a positive EIA for anti-HCV.
B. Persons with antibodies to HCV may have chronic HCV infection.
C. A subset of persons acutely infected with HCV will not develop chronic HCV infection.
D. Detecting HCV RNA by a nucleic acid test is necessary before initiating drug therapy.

Question #5
Which of the following is FALSE regarding interferon/ribavirin therapy for hepatitis C?

A. Hemolysis from ribavirin is a common side effect.
B. Ribavirin can be given as monotherapy if interferon is contraindicated.
C. A flu-like syndrome should be anticipated with initiation of interferon therapy.
D. Ribavirin may cause birth defects even in a woman who has just stopped taking ribavirin.

Question #6
Which of the following statements is FALSE regarding the natural history of hepatitis C?

A. Most persons with chronic HCV infection will not develop cirrhosis.
B. Persons with a history of heavy alcohol use are more likely to develop cirrhosis.
C. Persons with HIV infection and chronic HCV infection are more likely to develop cirrhosis.
D. The HCV genotype determines which persons with HCV infection will develop cirrhosis.

Question #7
Which of the following statements is FALSE regarding antiviral therapy with pegylated interferon and ribavirin for chronic hepatitis C?

A. The likelihood of responding to treatment does not depend on genotype.
B. The duration of treatment does depend on the HCV genotype.
C. Persons have a better response to antiviral treatment if cirrhosis has not developed.
D. Some patients may have undetectable HCV RNA 6 months after treatment.

Question #8
Which of the following statements is FALSE regarding cirrhosis and chronic HCV infection?

A. Beta-blockers prevent bleeding in persons with cirrhosis and large esophageal varices.
B. A patient with hepatic encephalopathy is a good candidate for antiviral therapy.
C. Peritonitis may be the source of fever in a person with marked ascites.
D. Persons with chronic HCV infection and cirrhosis are at risk for hepatocellular carcinoma.

Provider Self-Assessment - Answers
(Viral Hepatitis)

1. - E

2. - B

3. - C

4. - A

5. - B

6. - D

7. - A

8. - B